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OFF-FARM WORK IN MONTANA

Paul E. Polzin

BUREAU OF BUSINESS AND ECONOMIC RESEARCH missoula ● montana

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by

Paul E. Polzin

June 1969

Montana Economic Study

Staff Study

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University of Montana
School of Business Administration
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OFF-FARM WORK IN MONTANA

Modern agriculture is a far cry from what it was 50--or even 15--years ago. Modern methods and technology have turned what was once a cruel and never-ending struggle of man against nature into a smoothly running process. No longer is most of the population required to live on farms in order to provide for a minority of city dwellers. Once, one man with a horse and plow could barely provide for his family. Now, a single farmer with his tractor and hybrid seeds can feed and clothe 20 of his nonfarm compatriots.

One of the pronounced effects of the agricultural revolution has been the consolidation of individual farms and an accompanying massive off-farm migration. However, it would be misleading to characterize this process as simply one in which existing farms become uneconomic and their owners move to the city. Even though the overall trend is toward a smaller agricultural sector with larger units, there are many reasons for an individual farm to remain in production even though it may be of less than optimum size.[1]

At the same time that technology was reducing the labor requirements of agriculture, modern transportation has removed much of the isolation

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1. For example, it is usually easier for younger people to make the necessary adjustments involved in moving off-farm. Consequently, many farms are retired at the turn of a generation rather than when technology makes the farm inefficient. Also, many people prefer rural life and gladly accept the consequences of remaining in agriculture.

of rural life. Distances which used to take hours or days to traverse can now be routinely covered in a matter of minutes.

These two factors, increased productivity of agricultural labor and the availability of high-speed transportation, have increased the economic opportunities of those who choose to remain on the farm. They are no longer tied to their land. The modern farmer can use modern machinery to produce more food in less time and, if he so desires, devote some of the time saved to an off-farm job--supplementing his agricultural earnings.

This paper will examine and analyze the off-farm work of Montana people in agriculture. In Montana, as elsewhere, technological advances have drastically reduced the number of people on farms.[2] However, agriculture still remains the economic backbone of many regions in the state. The off-farm work of Montana farmers, because of the size of the agricultural sector, provides a significant pool of labor which can be tapped for use in new industries.[3] Also, the farm sector accounts for a disproportionate share of the state's poverty, and it would be interesting to know the extent to which our farm families supplement their income from nonfarm sources.

Extent and Geographic Distribution of Off-Farm Work

Table 1 presents summary information concerning off-farm work by Montana people in agriculture during 1964. The most revealing data

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2. Paul E. Polzin, Employment Trends in Montana: 1950-1968, Staff Study, Montana Economic Study (Missoula, Montana: Bureau of Business and Economic Research, University of Montana, June 1970).

3. To the extent that off-farm employment simply delays migration, the long run availability of this labor is in doubt. This aspect will not be examined in this paper.

concern the average number of days worked off farm at nonfarm jobs by farm operators and other members of their families. This magnitude varies from a high of 67.5 days in Mineral County to a low of 8.6 days in Garfield County. The average for the state was 21.0.

Figure 1 presents a geographical representation of off-farm work by county. It is interesting to note that the counties which have the greatest amount of off-farm work are all located in the western part of the state. Also, counties containing major population centers, such as Cascade and Yellowstone, show more than the average number of days worked off-farm. Later, an explanation will be offered which suggests that this pattern is not random but dependent on differing economic and demographic features.

The off-farm work by people in agriculture may provide a sizable portion of the nonagricultural labor requirements in a local area. However, available data can provide only a rough estimate because the number of days worked off-farm must be converted into "full-time equivalents" to make them comparable with nonagricultural employment information. This may be done by assuming that 250 days a year worked off-farm is equivalent to one full-time worker. The resulting magnitude--the number of full-time jobs that could be filled by people from agriculture--may be compared to actual employment to gauge the extent to which nonagricultural jobs are filled by off-farm workers.[4]

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4. The nonagricultural employment data presented include only wage and salary workers covered by Social Security. The major exclusions are the self employed, government, and railroad workers. Also, the reported data refer to employment in only the first quarter of 1968.

TABLE 1

Off-Farm Work in Montana, by County
1964

County	Farm Operators and Other Members of Their Household	Days Worked Off-Farm at Nonfarm Job	Average Number of Days Worked Off-Farm	Off-Farm Employment (Full-Time Equivalent)	Nonagricultural Employment (1st Quarter Only)	Ratio of Full-Time, Off-Farm Employment to Nonagricultural Employment
Beaverhead	1,053	12,155	11.5	48.62	871	.0558
Big Horn	2,134	38,845	18.2	155.38	1,226	.1267
Blaine	2,217	42,036	19.0	168.14	471	.3570
Broadwater	778	13,846	17.8	55.38	246	.2251
Carbon	2,846	40,282	14.2	161.15	484	.3329
Carter	1,198	14,093	11.8	56.37	106	.5318
Cascade	5,228	92,964	28.8	371.86	15,516	.0240
Chouteau	3,598	40,898	11.4	163.59	425	.3849
Custer	1,289	17,096	13.3	68.38	2,181	.0314
Daniels	1,806	22,097	12.2	88.39	253	.3493
Dawson	2,294	35,282	15.4	141.13	1,865	.0757
Deer Lodge	292	6,109	27.8	32.44	5,073	.0100
Fallon	1,315	25,925	19.7	105.69	720	.1468
Fergus	3,525	52,604	14.9	210.42	1,661	.1267
Flathead	5,772	158,452	42.9	633.81	5,602	.1131
Gallatin	5,332	88,295	26.6	353.18	5,875	.0601
Garfield	1,201	8,608	8.6	34.43	112	.3074
Glacier	1,737	36,556	20.8	146.22	1,313	.1114

Sources: [Off-Farm Work] U.S. Department of Commerce, Bureau of the Census, U.S. Census of Agriculture: 1964, Statistics for Each State and Counties, Montana (Washington, D.C.: U.S. Government Printing Office, 1967), table 5.

[Nonagricultural Employment] U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1967 (Washington, D.C.: U.S. Government Printing Office, 1967), table 2.

TABLE 1 (Continued)

County	Farm Operators and Other Members of Their Household	Days Worked Off-Farm at Nonfarm Job	Average Number of Days Worked Off-Farm	Off-Farm Employment (Full-Time Equivalent)	Nonagricultural Employment (1st Quarter Only)	Ratio of Full-Time Off-Farm Employment to Nonagricultural Employment
Golden Valley	602	9,903	16.5	39.61	35	1.2003
Granite	560	15,297	27.3	61.19	322	.1900
[illegible]	2,949	46,085	15.6	184.34	2,251	.0817
Jefferson	826	20,810	25.2	83.24	248	.3356
Judith Basin	1,425	14,492	10.2	57.97	87	.6665
Lake	4,260	144,160	33.8	576.64	1,202	.4797
Lewis & Clark	1,092	37,343	34.2	149.37	6,224	.0240
Liberty	1,249	19,293	15.4	77.17	161	.4793
Lincoln	1,039	53,255	51.3	213.02	2,462	.0865
McCone	2,222	28,181	12.7	112.72	219	.5147
Madison	1,463	25,397	17.4	101.59	257	.3953
Meagher	490	7,921	16.2	31.68	344	.0921
Mineral	228	15,353	67.3	61.41	467	.1315
Missoula	1,581	65,579	41.4	262.32	10,841	.0241
Musselshell	900	18,982	21.1	75.93	422	.1799
[illegible]	1,374	22,858	19.0	119.35	1,355	.0881
Petroleum	358	3,050	8.5	12.20	32	.3813
[illegible]	2,319	34,943	15.1	139.77	440	.3177
[illegible]	2,372	32,959	13.3	131.84	661	.1995
[illegible] River	1,238	18,347	14.6	73.39	209	.7376
[illegible]	731	13,587	18.6	54.35	958	.0567

TABLE 1 (Continued)

County	Farm Operators and Other Members of Their Household	Days Worked Off-Farm at Nonfarm Job	Average Number of Days Worked Off-Farm	Off-Farm Employment (Full-Time Equivalent)	Nonagricultural Employment (1st Quarter Only)	Ratio of Full-Time, Off-Farm Employment to Nonagricultural Employment
[illegible]	787	10,746	13.7	42.98	190	[illegible]
[illegible]	3,864	136,128	35.2	544.47	1,219	[illegible]
[illegible]	2,926	51,760	17.7	206.84	1,420	[illegible]
[illegible]	2,867	54,932	19.2	219.73	1,190	[illegible]
[illegible]	1,380	20,899	15.1	83.60	420	[illegible]
[illegible]	1,706	52,682	30.9	210.73	883	[illegible]
[illegible]	2,949	44,665	15.1	178.66	677	[illegible]
[illegible]	591	27,079	45.8	108.32	11,804	[illegible]
[illegible]	1,858	32,390	17.4	129.56	330	[illegible]
[illegible]	1,052	11,770	11.2	47.08	268	[illegible]
[illegible]	2,808	47,346	16.9	189.38	491	[illegible]
[illegible]	1,644	17,146	10.4	68.58	861	[illegible]
[illegible]	508	6,431	12.7	25.72	54	[illegible]
[illegible]	3,445	74,250	21.6	297.00	1,695	[illegible]
[illegible]	549	12,441	22.7	49.76	195	[illegible]
[illegible]	830	12,928	15.5	51.71	95	[illegible]
Yellowstone	4,443	111,107	25.0	444.43	18,161	.0245

Figure 1

Average Number of Days Worked Off-Farm
by Farm Operators and Their Families, Montana, 1964

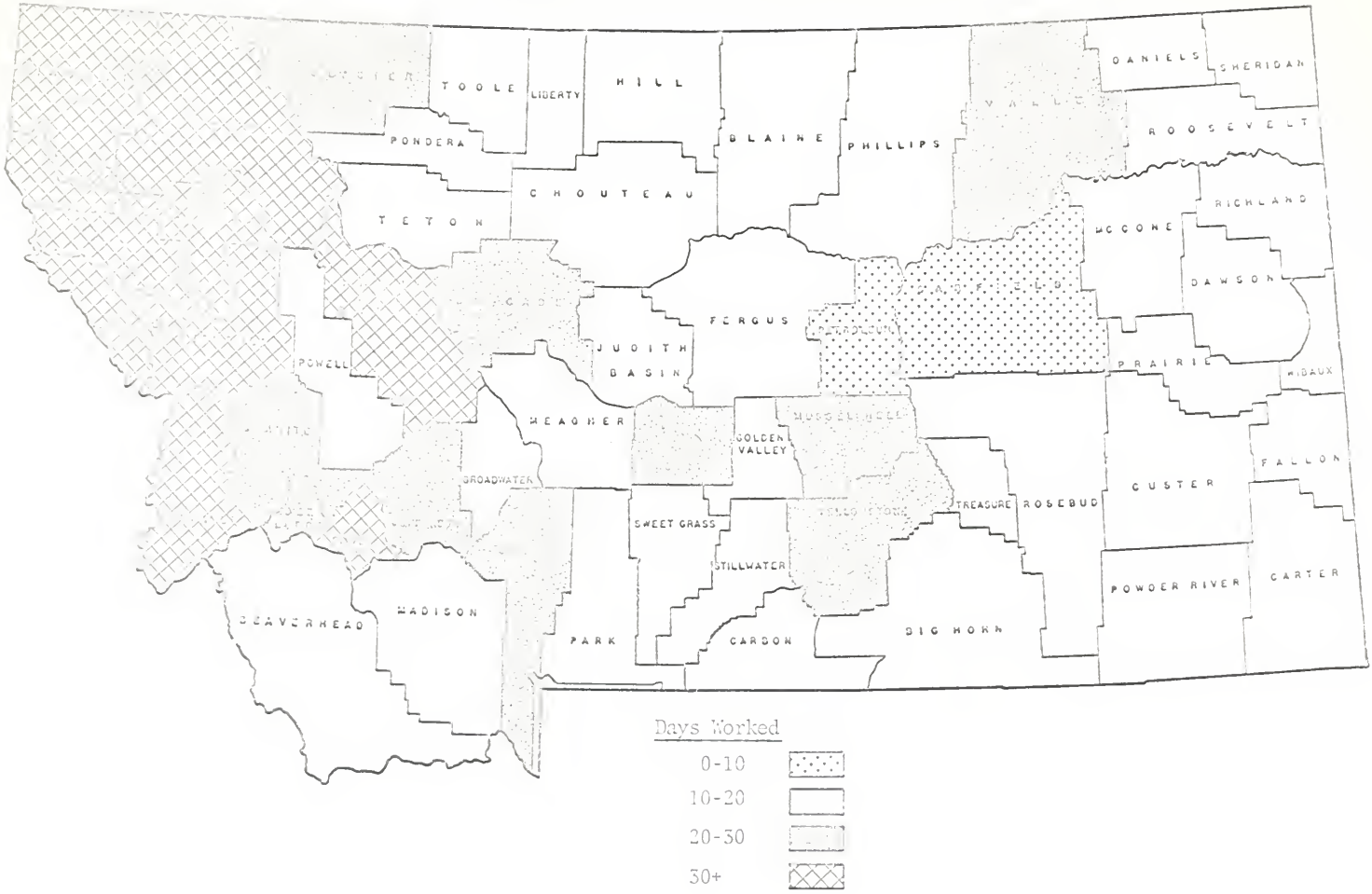

Table 1 shows that there is considerable variation between counties in the portion of nonagricultural jobs filled by people from agriculture. Off-farm work as a percent of nonagricultural employment varies from a low of .9 percent in Silver Bow to 67 percent in Judith Basin County.[5] In general, the rural counties depend relatively more on people from agriculture to fill nonfarm jobs. However, even in relatively urban counties, off-farm workers fill a sizable portion of the nonagricultural jobs.

The extent of off-farm work by people in agriculture may also be measured by the portion of their income which is derived from nonfarm sources. Table 2 presents data, by county, showing the income of farm families from nonagricultural sources and the receipts from the sale of farm products.[6] The larger the income from nonagricultural sources relative to the receipts from farm products, the more dependent we can assume the families to be on off-farm employment.

Farm families in Lincoln County, in the far northwest corner of the state, receive almost twice as much nonagricultural income as they do receipts from the sale of farm products. On the other hand, in Beaverhead County nonagricultural income is only 5 percent of the receipts from the sale of farm products.

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5. The rough nature of the calculations cannot be overemphasized. We have, for example, Golden Valley County in which there are more off-farm workers than nonagricultural jobs. The exclusion of government and railroad jobs may account for some of this anomaly. Also, a number of the off-farm workers may commute to nearby Billings, which is in Yellowstone County.

6. Once again, these data are only indicative, not definitive, and should be taken with a grain of salt. Nonagricultural income also includes such sources as rent and stock dividends. Receipts for farm products sold is a gross figure from which cost [illegible].

TABLE 2

Income from Farm and Nonfarm Sources
1964

County	Income From Nonfarm Sources	Value of Farm Products Sold	Ratio of Nonfarm Income to Value of Farm Products Sold
Beaverhead	$ 490,104	$ 9,651,580	.0507
Big Horn	1,286,660	10,621,886	.1211
Blaine	1,536,095	10,849,867	.1415
Broadwater	507,644	3,499,474	.1450
Carbon	1,248,629	8,145,161	.153[illegible]
Carter	545,166	4,682,658	.1164
Cascade	3,092,891	14,366,506	.215[illegible]
Chouteau	2,144,250	20,450,808	.1048
Custer	738,498	7,300,598	.1011
Daniels	954,813	6,499,273	.1469
Dawson	1,536,498	7,046,009	.2181
Deer Lodge	190,745	1,438,755	.1328
Fallon	912,227	4,244,540	.2149
Fergus	2,015,888	12,587,034	.1599
Flathead	4,418,531	5,585,440	.7910
Gallatin	2,702,794	11,166,043	.2420
Garfield	524,358	5,971,219	.0878
Glacier	1,147,508	8,358,668	.1372
Golden Valley	306,127	2,450,943	.1249
Granite	466,901	2,379,200	.2048
Hill	2,460,442	11,976,053	.2054
Jefferson	627,491	1,938,379	.3237
Judith Basin	742,512	6,937,597	.1070
Lake	3,958,336	8,309,042	.4763
Lewis & Clark	1,246,126	5,714,515	.2180
Liberty	1,216,157	5,931,759	.2050
Lincoln	1,508,568	710,021	2.1246
McCone	1,805,667	6,342,637	.2846
Madison	1,127,460	6,590,813	.1710
Meagher	267,221	3,044,256	.0877
Mineral	293,340	258,240	1.1359
Missoula	1,821,846	2,599,262	.7009
Musselshell	627,468	3,085,918	.2033
Park	1,133,965	5,375,706	.2109
Petroleum	160,517	1,854,712	.0865
Phillips	1,057,777	9,050,157	.1168
Pondera	1,572,839	11,285,990	.1393
Powder River	897,037	4,862,772	.1844
Powell	550,980	3,795,348	.1451
Prairie	355,569	4,086,877	.0870
Ravalli	3,539,965	6,996,658	.5059
Richland	1,785,786	12,011,633	.1486
Roosevelt	2,10[illegible],940	9,889,560	.2124
Rosebud	896,132	7,725,204	.1160
Sanders	1,375,381	2,017,197	.6818
Sheridan	1,808,728	8,933,228	.2024
Silver Bow	712,386	615,467	1.1574
Stillwater	1,000,578	6,749,113	.1482
Sweet Grass	548,867	4,331,486	.1267
Teton	2,163,383	11,453,985	.1888
Toole	1,247,344	8,520,641	.1463
Treasure	170,656	2,971,646	.0574
Valley	2,371,675	12,295,491	.1928
Wheatland	556,840	2,948,877	.1210
Wibaux	514,938	2,609,406	.1973
Yellowstone	5,704,122	21,671,411	.1779

Source: U.S. Department of Commerce, Bureau of the Census, U.S. Census of Agriculture: 1964, Statistics for the State and Counties, Montana (Washington, D.C.: U.S. Government Printing Office, 1967), table 6.

Figure 7 shows that the dependence on off-farm work as measured by income sources generally parallels the number of days worked off farm. The counties in the western part of the state are much more dependent on nonagricultural sources of income than the rural areas in the east.

In summary, people in agriculture living in the western and urban counties of Montana seem to rely on off-farm employment, whether measured by days worked off-farm or other sources of income, to a much greater extent than elsewhere. On the other hand, the rural counties, with their smaller pool of resident nonagricultural workers, probably rely on people from agriculture to fill many of their nonfarm jobs.

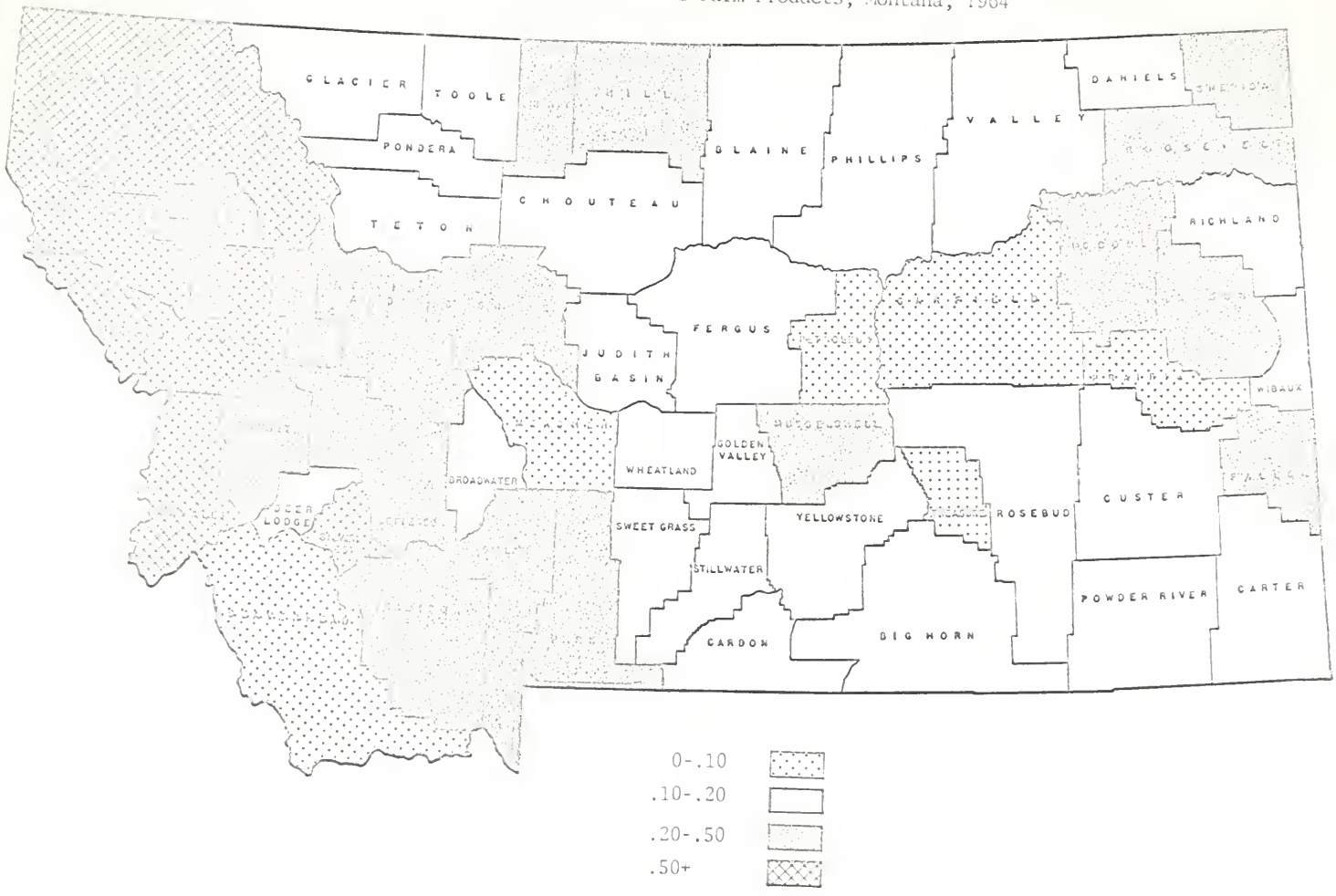
Factors Behind Variations in Off-Farm Work

The previous section outlined the extent of off-farm work and its distribution among Montana's counties. However, maps and tables do not tell us all we want to know. Why, for example, is there such a large variation between counties in the average number of days worked off-farm? Also, why do farmers in the western part of the state work off-farm more than their eastern counterparts? In other words, we are not just interested in how much work is done off-farm. Rather, we would also like to know the factors that influence a farmer's decision as to how he should divide his time between on- and off-farm work.

The best way to gain an insight is to look at a representative farmer and see what things may influence his decision to work off farm. One important factor which may affect off-farm work is the time he must spend commuting to a nonagricultural job. One would expect that a farmer who lived only one mile from a job would be more inclined to work off farm than a farmer who would have to travel 20 miles. In

Figure 2

Ratio of Income from Nonfarm Sources
to Receipts from the Sale of Farm Products, Montana, 1964



other words, these counties in which farmers must travel great distances to nonagricultural jobs could be expected to have less off-farm work.

The potential off-farm worker must also consider what he loses by working part time in a nonagricultural job. Specifically, when a person works off his farm he will have less time to spend on his chores. If the farm is particularly productive, the fields left untended or the tractor not repaired may result in a considerable decline in farm output and revenue. With this in mind, one would expect that, everything else being equal, the more profitable the farm, the less the operator and his family will want to work off-farm.

The desire to work off-farm is only half of the picture -- employment opportunities must also be available. Even the most rural counties have some nonfarm jobs. However, such positions (for example, a feed store operator) usually require a person's undivided attention and are not well suited for the part-time farmer. On the other hand, many industrial or manufacturing jobs provide the flexibility and variety of work schedules which could be filled by people from agriculture. Thus, if everything else were the same, counties with many manufacturing jobs would be expected to have more off-farm work.

There are, of course, many personal reasons which may lead a person to seek off-farm work. But the three factors just considered should go a long way toward explaining the variations between counties in off-farm work. Considering them one by one while holding everything else constant, we would expect that rural counties, with their greater average distances, would have less off farm work. Counties with relatively unproductive farms would have more farmers seeking part time employment. Finally, the presence of manufacturing jobs will provide increased opportunities for people in agriculture to find other employment.

Using the previous discussion as a guide, a detailed statistical investigation of off-farm work in Montana counties was undertaken. The percent of a county's population classified as rural-farm in the 1960 Census was used as a proxy for the distance to off-farm employment. It was reasoned that the greater the proportion of population classified as rural-farm, the more isolated the average farmer in that county would be and the further he would have to drive to a nonfarm job. The productivity of the farms in a county was represented by the average per farm receipts from the sale of farm products; the rationale being that high per farm revenue represents a large and efficient farm which would require considerable on-farm work. Finally, the availability of nonfarm jobs is assumed to be reflected in the percent of employment in manufacturing as reported in the 1960 Census.

Regression analysis was chosen as the statistical tool to be used in examining off-farm work. This device takes the phenomenon to be explained--in this case, the average days worked off-farm in the various counties--and shows how it has been influenced by other variables, such as rural-farm population, farm revenue, and manufacturing jobs. In effect, regression analysis determines the equation of the form:

$$W = a + bRF + cI + dM$$

which best fits the data, where W is average days worked off-farm, RF is the percent rural-farm, I is per farm receipts from farm products, and M is the percent of nonagricultural employment in manufacturing. The values of b, c, and d which are estimated by regression analysis describe the effects of these variables on W.[7]

7. The regression technique finds the values of a, b, c, and d such that the squares of the differences between the estimated equation and the actual observations are a minimum.

The actual regression equation fitted from [illegible] is presented in table 3. For example, the number .515 on % persons manufacturing indicates that if we increase the proportion of employment in manufacturing by one percentage point, holding everything else constant, off-farm work in that county will increase by about one-half of a day per year. This is probably caused, as was discussed previously, by the fact that manufacturing jobs are most convenient for off-farm workers. Figure 3, which presents the scatter diagram for Montana counties and the equation implied by the regression, shows this relationship.[8] There is considerable variation in the actual points around the regression, but the trend definitely suggests that the counties that offer relatively more manufacturing employment have more off-farm work.

The negative coefficient on rural-farm population suggests that the more rural counties have less off-farm work. This is consistent with the argument that increased commuting time in the most isolated areas of the state acts as a deterrent to off-farm work. The negative correlation between off-farm work and percent rural farm is obviously present in the scatter diagram of Montana counties in figure 4.

The regression equation confirms the suggestion that counties with very productive farms tend to have a smaller average number of days worked off-farm. The negative coefficient of 1, average receipts per farm from agricultural products sold, indicates that a $1,000 increase in the sale of farm goods would reduce the days worked off-farm by .87. The scatter

8. The equations plotted in figures 3, 4, and 5 may look as though they do not provide the "best fit" of the data points. However, the regression equation is actually a plane in four dimensional space. Looking at it only two dimensions at a time, as in the scatter diagrams, does not provide a true representation.

TABLE 3

Regression Equation for Off-Farm Work in Montana

$$W = 36.758 - .2198\ RF - .00087\ I + .515?\ M$$
$$\underset{-4.189}{(.0525)} \quad \underset{-6.206}{(.00014)} \quad \underset{4.676}{(.110?)}$$

$R^2 = .7766 \qquad N = 56$

Where

W: the average number of days worked off-farm at nonfarm jobs by farm operators and other members of their family.

RF: the percent of the counties 1960 population classified as rural-farm.

I: average receipts per farm from the sale of agricultural products.

M: the percent of employment in manufacturing.

Note: The numbers in parentheses are the standard errors of the coefficients. The "t" statistics are present in the third row. Both of these numbers are statistical measures of the accuracy of the estimated coefficients. The smaller the standard error and the larger the (absolute value of) "t" statistic the more confidence is placed in the estimate. For example, there is less than five chances out of a thousand that the estimated coefficients are actually zero. R^2 is the proportion of the variation of W explained by all three variables. N is the number of counties used in the regression.

Figure 3

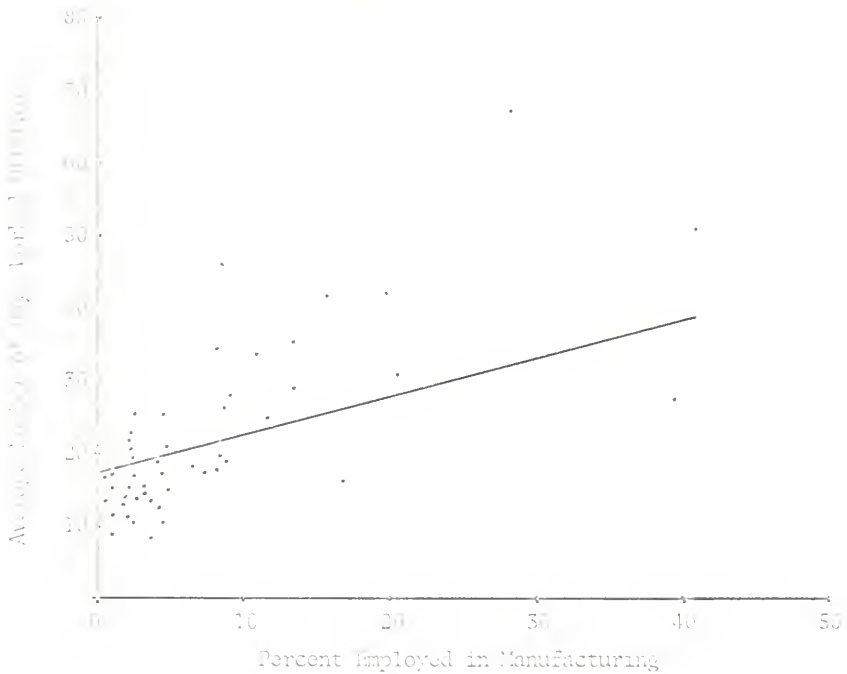
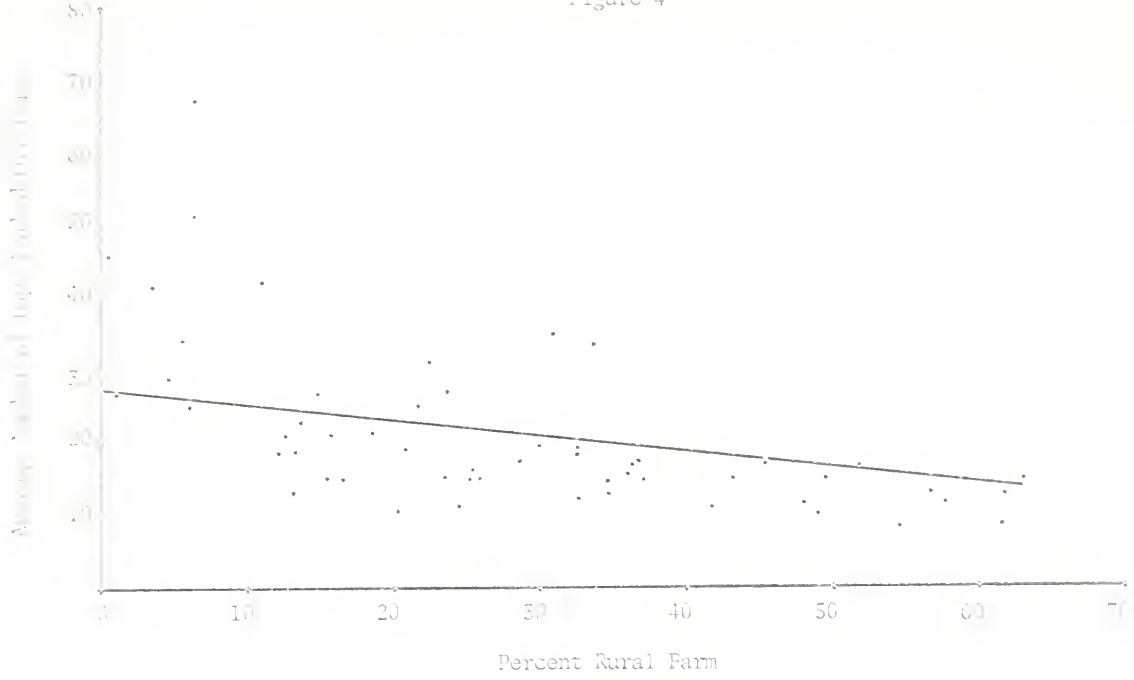


Figure 4



of points in figure 5 imply that the income foregone by working off farm is an important factor affecting the decision of people in agriculture.

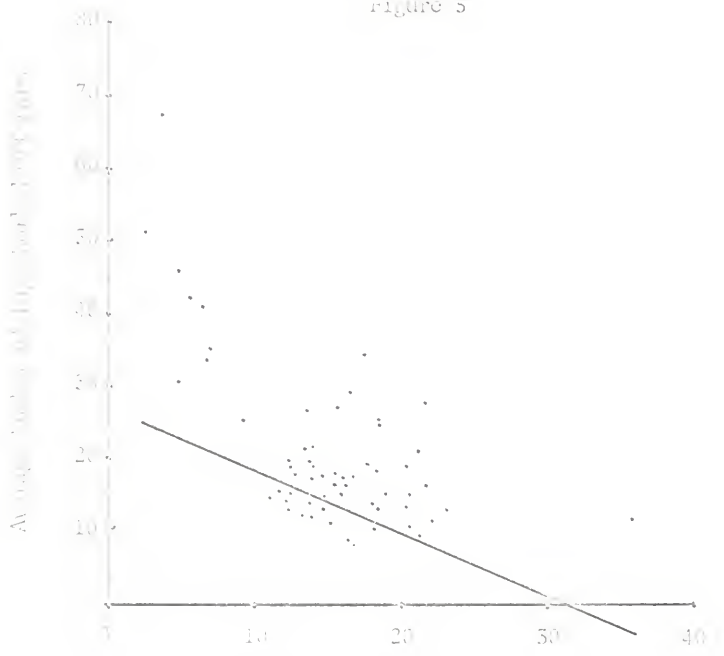
This section has attempted to go beyond the simple presentation of the facts and provide an explanation for intercounty variation in off farm work. Increased commuting in rural areas, the profitability of on farm work, and the availability of manufacturing jobs all influence the amount of work done off farm.[9] In fact, these three factors go a long way toward explaining the above-average days worked off-farm in the western and urban counties of the state. The population density is higher, farms tend to be smaller, and the lumber and metal refining industries provide manufacturing jobs in western counties. Also, one or all of these conditions are present in the other urban counties of Montana. Thus, the distribution of off-farm work by county, pictured in figures 1 and 2, conforms quite closely to what would be expected on the basis of simple economic analysis.

Hypothetical Changes in Off-Farm Work

The regression equation of table 3 concisely summarizes the various factors influencing off-farm work in Montana. However, its usefulness is not confined to explaining what has happened. It may also be used to obtain estimates of what may happen in the future. Imagine, for the moment, that a manufacturing plant wants to locate in Montana. What difference would it make to the local labor market if a plant decided to build in Sheridan rather than Yellowstone County? Or, what would be the effect on nonagricultural employment of a severe drought or a bumper harvest? The consequences

9. The major influence excluded from this study and one which would be expected to have a great effect on off farm work is the wage paid in nonfarm employment. Unfortunately, there is no information available on wages by county. Clearly, because manufacturing jobs tend to pay higher wages than other nonagricultural jobs, some of the influence of this factor may be present in M.

Figure 5



Average Value of Farm Products Sold

of either of these events on off-farm work can be predicted by inserting new values for M or I into the regression equation, holding the other variables constant.

The effect on off-farm work of locating a hypothetical new manufacturing plant with ten employees in each of Montana's counties is summarized in the second column of table 4.[10] The increase in full-time equivalent off-farm workers ranges from a low of .09 in Lewis and Clark County to a high of 3.66 workers in McCone County.[11] In general, the change in off-farm employment turns out greater in the rural counties because the ten new jobs result in a larger percent increase in manufacturing employment. This suggests that firms locating in rural areas could fill a sizable portion of their openings by using off-farm workers.

The previous analysis implies that farm receipts play an important part in determining off-farm work. However, great year-to-year variations in farm income--due to weather and other crop conditions--are common. This suggests that off-farm work will also display considerable fluctuation. A drought year may send many farmers into the nonagricultural sector seeking jobs. A bumper crop, on the other hand, could cause shortage of workers because people in agriculture would be forced to remain on their farms. Once again, the regression equation of table 3 may be used to estimate the effect of a change in farm receipts on off-farm work.[12]

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10. Ten workers were added to both manufacturing and total employment in each county and a new value for M was computed. The new estimate was subtracted from the old and inserted into the regression equation. The predicted change in average days worked off farm was converted to full-time equivalent employment.

11. A decrease of ten manufacturing jobs would have exactly the opposite effect in the various counties.

12. A large change in the price of farm products affects livestock and farm receipts could also be used.

TABLE 4

Hypothetical Changes in Off-Farm Work

County	Increase in Full-Time Off-Farm Workers as the Result of: 10 Percent Drop in Farm Receipts	Increase of Ten Manufacturing Jobs
Beaverhead	13.17	.65
Big Horn	13.49	1.32
Blaine	13.76	1.83
Broadwater	4.58	1.44
Carbon	10.90	2.35
Carter	5.81	2.47
Cascade	18.73	.13
Chouteau	27.73	2.97
Custer	9.32	.53
Daniels	8.45	2.61
Dawson	9.91	.95
Deer Lodge	2.20	.60
Fallon	5.81	1.89
Fergus	17.09	1.45
Flathead	7.27	.78
Gallatin	15.85	.68
Garfield	7.35	2.68
Glacier	12.94	1.09
Golden Valley	3.20	3.10
Granite	3.10	.92
Hill	16.10	1.21
Jefferson	2.68	1.19
Judith Basin	9.04	2.94
Lake	10.38	1.76
Lewis & Clark	6.69	.09
Liberty	8.27	2.83
Lincoln	1.04	2.14
McCone	9.53	3.66
Madison	7.64	1.51
Meagher	3.75	.81
Mineral	.30	.33
Missoula	3.52	.26
Musselshell	4.20	1.11
Park	7.01	.65
Petroleum	2.08	1.92
Phillips	11.85	1.91
Pondera	15.98	2.04
Powder River	6.31	2.85
Powell	5.11	.60
Prairie	4.93	1.78
Ravalli	9.59	1.59
Richland	16.12	1.81
Roosevelt	12.84	1.77
Rosebud	9.86	1.43
Sanders	2.87	1.05
Sheridan	12.18	2.43
Silver Bow	1.00	.12
Stillwater	9.03	1.91
Sweet Grass	5.58	1.73
Teton	15.54	2.31
Toole	11.86	1.03
Treasure	4.08	2.41
Valley	16.80	1.42
Wheatland	3.56	1.02
Wibaux	3.55	2.76
Yellowstone	28.85	.28

Source: Computed from tables 1, 2, and 3.

Table 4 presents estimates of the increase in off-farm work, obtained by using the regression equation, resulting from a 10 percent increase in the receipts from the sale of farm products. Judging from past experience, this is not an unusually large change.[13] The change in total off-farm workers ranges from a high of 28.56 workers in Yellowstone County to a low of .30 in Mineral County.[14] These changes will have the greatest impact in the rural counties because the addition of the equivalent to five or ten workers represents a considerable change in their small nonagricultural sectors.

This section has used the regression equation for Montana counties to explore the effects on off-farm work of a change in manufacturing jobs or farm receipts. It does not pretend to be an exact forecast. Rather, it is simply meant to demonstrate how this analysis may be used to obtain some idea of how the counties may differ in response to a hypothetical situation.

Summary

The agricultural sector of the economy has been declining, both here and nationally, but because of its relatively large size in Montana the actions of farmers have a significant impact on the whole state. Specifically, this paper has examined the off-farm work of Montana people nominally regarded as in agriculture. Geographically, farmers in the western and urban counties tend to rely on off-farm work, as measured by days worked off farm or sources

13. A new value for I in each county was calculated by subtracting 10 percent from the 1964 figure. Then the difference between the new and old estimate of farm receipts was inserted into the regression equation. The change in average days worked off farm was converted into full time equivalent employment.

14. Alternatively, a 10 percent increase would have exactly the opposite effect.

of income, were thus drive [illegible] and rural communities. This [illegible] not covered by changes. The availability of manufacturing jobs [illegible] shown to be positively related to the amount of off farm work, while commuting time and farm revenue are negatively correlated with off farm work. Some or all of these conditions are present in counties with large amounts of off-farm work. The relationship explaining off-farm work was then used to examine, statistically, the effects of hypothetical changes in farm receipts or manufacturing jobs.